

GAO

Report to the Ranking Minority Member,  
Subcommittee on Readiness, Committee  
on Armed Services, U.S. Senate

November 1998

# GENDER ISSUES

## Improved Guidance and Oversight Are Needed to Ensure Validity and Equity of Fitness Standards



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National Security and  
International Affairs Division

B-281068

November 17, 1998

The Honorable Charles Robb  
Ranking Minority Member  
Subcommittee on Readiness  
Committee on Armed Services  
United States Senate

Dear Senator Robb:

At your request, we have reviewed the services' physical fitness and body fat standards to determine if (1) differences exist among the military services in physical fitness standards and tests and the basis for any difference, (2) the services have a sound basis for adjusting the standards for gender and age, and (3) the Department of Defense (DOD) exercises adequate oversight of the fitness program. We found that there are significant differences between the standards and tests the services use to measure physical fitness, that adjustments made to these standards for age and gender were not always based in science, and that DOD oversight of the services' programs has not always been adequate. This report includes recommendations which, if implemented, should result in more scientifically based fitness standards and improve DOD's oversight.

We are sending copies of this report to interested congressional committees and Members of Congress; the Secretaries of Defense, the Army, the Air Force, and the Navy; the Commandant of the Marine Corps; and the Director, Office of Management and Budget. We will also make copies available to other interested parties upon request.

Please contact me at (202) 512-5140 if you or your staff have any questions concerning this report. The major contributors to this report are listed in appendix II.

Sincerely yours,

A handwritten signature in black ink that reads "Mark E. Gebicke". The signature is written in a cursive, flowing style.

Mark E. Gebicke  
Director, Military Operations  
and Capabilities Issues

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# Executive Summary

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## Purpose

Physical fitness is a fundamentally important part of military life for both men and women in the Department of Defense (DOD). Each year, thousands of servicemembers are denied promotions, schooling, or other benefits for failing to meet fitness standards. Despite remedial programs, many of these personnel are eventually forced to leave the military for continued failure to meet the standards. The growing role of women in the armed forces—some in physically demanding positions—has been accompanied by debate over fundamental and sometimes contentious issues, including whether the fitness standards are fair and appropriate to both sexes in today's military.

The Ranking Minority Member, Subcommittee on Readiness, Senate Committee on Armed Services, requested that GAO review a series of issues regarding the treatment of men and women in the military. This report discusses issues related to the physical fitness program. Specifically, GAO determined whether (1) differences exist among the military services in physical fitness standards and testing and the basis for any differences, (2) the services have a sound basis for adjusting the standards for gender and age, and (3) DOD exercises adequate oversight of the fitness program.

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## Background

DOD's guidance requires that the services establish a physical fitness and body fat program that includes fitness requirements for all servicemembers. This guidance requires annual testing, regardless of age, of cardiovascular endurance (measured by activities such as running a certain distance within a specified time limit), muscular strength and endurance (measured by activities such as sit-ups and push-ups), and maintenance of body fat within a certain percentage range. The guidance does not specify particular testing activities or minimum required levels of difficulty. Each military service is required to design its own fitness program and provide DOD with annual reports that assess the program. The Office of the Assistant Secretary of Defense for Force Management Policy within the Office of the Secretary of Defense is responsible for monitoring the program. In response to rising problems with the existing policy, the Assistant Secretary established a joint service working group in September 1996 to study these problems, and the National Academy of Sciences was also requested to help analyze the complex research available on fitness and body fat issues. The Academy's report was issued in March 1998.

Two kinds of physical performance requirements are placed on members of the military: job-specific physical performance standards applicable to particular occupations and general physical fitness standards that are

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applicable to all members regardless of their occupation. The purpose of job-specific physical performance standards is to ensure that personnel assigned to physically demanding jobs are capable of performing those jobs. On the other hand, the primary purpose of general fitness standards is to maintain the overall health and conditioning of personnel. These standards are not intended to specifically enhance the performance of a particular service mission or job. This report focuses on general physical fitness standards.

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## Results in Brief

Significant differences exist in the tests and standards that the military services use to measure physical fitness. These differences reflect varying levels of difficulty in required performance in all testing areas—cardiovascular endurance, muscular strength and endurance, and percentage of allowable body fat—and occurred for different reasons. Specifically, services did not always adhere to DOD guidance for fitness testing or, in some cases, interpreted the guidance differently. Service officials stated that confusion over the program's objectives, stemming from conflicting statements in DOD's guidance, contributed to differences among the services.

Adjustments to account for physiological differences by age and gender are, according to experts, appropriate for general fitness and health standards, and DOD guidance requires that gender-based adjustments be made. Although each of the services adjusts for gender, the degree of adjustment varies considerably. Inconsistent and sometimes arbitrary approaches to adjusting the standards have contributed to questions concerning the fairness of the standards applied to military men and women. For example, male standards were usually based on statistics recording men's actual performance on fitness tests. However, female standards were often estimated, inferred from male data, or based on command judgment rather than data on actual performance. Body fat standards are also questionable due to (1) differences in each service's equations for estimating body fat, resulting in estimates ranging between 27 and 42 percent for the same woman; (2) outdated measurement approaches that did not account for racial differences in bone density; and (3) changes in ethnicity and other population characteristics of the current military that question whether the populations used to develop the equations represent the populations in today's military. Moreover, despite a clear requirement for all services to test all personnel regardless of age, the Navy and, until recently the Marine Corps, have exempted older

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personnel from fitness testing for years because of concerns about being able to retain senior leaders.

DOD's guidance and oversight of the service physical fitness programs are not adequate. In particular, multiple program objectives and lack of DOD monitoring of service compliance with key policies, have persisted since at least the early 1980s without resolution. Also, DOD has not enforced annual reporting requirements or identified a common set of statistics to use in monitoring the services' fitness programs. The statistics currently maintained by the services lack standardization: some do not include servicewide information, and others do not contain information on key characteristics, such as failure or separation rates by gender or rank. The limited data available raise questions about program effectiveness because failure rates appear to be markedly different among the services and women appear to fail at significantly higher rates than men.

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## Principal Findings

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### Lack of Adherence to DOD Policy and Confusion Over Multiple Objectives Contribute to Differences in Service Requirements

Physical fitness testing differs markedly by service. For example, although DOD guidance requires testing of muscular strength and endurance, the Air Force does not require any such tests. In contrast, the Army, Navy, and Marine Corps require their personnel to perform push-ups, pull-ups, and sit-ups to be promoted and remain in the military.

The level of difficulty of fitness standards varies widely among the services. For example, to measure the cardiovascular endurance of 45-year-old men and women, the Navy requires a 1-1/2 mile run within about 17 and 18 minutes, respectively; the Army, a 2-mile run within about 19 and 24 minutes;<sup>1</sup> and the Marine Corps, a 3-mile run within 30 minutes for men and 33 minutes for women. The Air Force measures cardiovascular endurance by having its personnel use a stationary bicycle, and requires 45-year old men and women to complete a simulated distance of about 1-1/2 miles in about 17 and 19 minutes, respectively.

The services also vary significantly regarding the weight-to-height standards used to screen personnel to determine whether more specific

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<sup>1</sup>New Army fitness standards were expected to be implemented on October 1, 1998. However, according to Army Physical Fitness School officials, implementation has been delayed until early January 1999 to allow for additional review and feedback from commanders, and to complete and distribute new fitness scorecard forms. The Army standards referred to in this report are the new pending standards.

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measurement of body composition is required. In addition, the services' maximum allowable percentages of body fat range from 18 to 26 percent for men and 26 to 36 percent for women.

Service officials attribute some differences in the difficulty of the standards to confusion regarding the primary objective of the physical fitness program. DOD guidance states that the services should place primary emphasis on fitness programs that develop general health and physical fitness, and officials in each of the services cited this emphasis as a main objective. However, DOD guidance also states that the services should establish fitness requirements in accordance with their particular mission, incorporate job-specific standards into the programs, and implement body fat programs that enhance military appearance. Service officials indicated that the inclusion of the additional objectives created confusion regarding the main purpose of the program. Specifically, they said that the emphasis given to these other objectives varied and that the difficulty of the overall standards was raised or lowered in accordance with that emphasis.

Despite the apparent confusion resulting from the language of the guidance, this distinction between general fitness standards and job-specific physical performance standards is set forth in a 1995 DOD report to the Congress on gender-neutral standards. Also, according to the Office of the Secretary of Defense official responsible for overseeing the fitness program, physical fitness standards are intended only to set a minimum level of general fitness and health for military personnel and are not directly related to job performance.

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### Inconsistent and Sometimes Arbitrary Standards Create Potential Gender and Age Inequities

All services adhered to the DOD policy requiring adjustments to fitness standards to take into account strength and other physiological differences between the sexes. The extent to which the standards were adjusted for gender, however, varied greatly by service. For example, the standard for the cardiovascular endurance test varied, allowing women from 9 percent more time in the Air Force to 27 percent more time in the Army. For sit-ups, the Army and the Marine Corps required both men and women to do the same number in the same time, but the Navy allowed women to do about 17 percent fewer sit-ups. For push-ups, the Army's standard for women was 60 percent lower than its men's standard, and the Navy's standard for women was 75 percent lower than its men's standard.

In most services, the rationale used to adjust the standards was poorly documented. Also, the services' bases for adjusting the standards for women were often different than those used for men. Male standards were usually based on actual test performance data, whereas the female standards were often estimated, inferred from male data, or based on command judgment. For example, in September 1998, the Navy reduced by as much as 1 minute and 15 seconds the time allowed for women under 30 years old to complete the 1-1/2 mile run. However, the time allowed for these women to complete the run was not based on actual performance times, as were the men's and women 30 or over. Instead, the standards were derived by multiplying the men's standards by a factor to reflect a mean 18-percent difference between male and female aerobic capabilities, as calculated by Navy researchers. This change was made because of command beliefs that the existing 4-minute difference between the standards in certain categories was not appropriate, and female standards needed to be more stringent. The standards for men and for women 30 and older were not changed.

Additional questions about body fat standards result from differences in each service's equations for estimating body fat; outdated measurement approaches that did not account for racial differences in bone density; and changes in ethnicity and other demographic characteristics, making the population used to develop the equations less representative of the current military. Researchers found that the equations used by each service to determine body fat yield consistent results for men but not for women because the equations do not adequately adjust for the greater variety of female body types. For example, the Army's equation estimated one woman's body fat at 42 percent, whereas the estimated percentage of body fat for the same woman was 29 percent using the Navy and the Air Force equations and 27 percent using the Marine Corps equation. In addition, the equations currently in use do not account for racial differences in bone density, raising the potential for overstating the percentage of body fat of minority servicemembers. Moreover, researchers also report that, because the percentage of minorities is increasing in the female service population and the average age of women in the service is increasing, the populations of active-duty soldiers used to develop the equations have, over time, become less representative of the ethnic and age diversity of the current military population.

Personnel of different ages were also treated differently, depending upon the service. Members of the Army and the Air Force are tested for fitness throughout their careers, regardless of age, in accordance with DOD policy.

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However, for years the Navy and the Marine Corps have not tested older personnel—currently those 50 and older in the Navy and as recently as June 1998, those 46 and older in the Marine Corps—due to concerns about retaining senior leaders. In July 1998, the Marine Corps changed its policy to require Marines of all ages to be tested.

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### DOD Oversight of the Physical Fitness Program Is Inadequate

Problems, such as multiple program objectives and failure to consistently enforce key policies, have existed in DOD's fitness program for many years due to inadequate oversight. For example, the references to objectives such as job-specific requirements and mission that are included in the most recent fitness directive also appeared in DOD's 1981 Physical Fitness and Weight Control directive. Similarly, the Navy and the Marine Corps have apparently not complied with DOD's guidance requiring testing of all personnel regardless of age since the requirement was established in 1981. Further, despite requirements for all services to evaluate muscular strength, the Air Force stopped testing for muscular strength and endurance in the early 1980s. Finally, at the time of our fieldwork, DOD had not enforced the annual report requirement that had been in place since 1995.

DOD officials said that action to correct some of the fitness program problems has begun. For example, initial agreement has been reached to continue to study implementing one body fat equation for men and one for women across all services. Additional recommendations made in a 1998 report by the National Academy of Science are still being reviewed, but drafting of policy revisions is planned for the fall of 1998. DOD officials noted that, following discussions with GAO, the Office of the Assistant Secretary for Force Management Policy informed the services that they would now be required to provide the annual reports. By September 1998 all services had provided the initial reports. DOD officials also acknowledged that enforcement of the annual reporting requirement could have provided a useful monitoring mechanism.

While enforcing the annual reporting requirement will provide some information for oversight, neither DOD nor the services have a basis to evaluate the overall fitness of military personnel or the effectiveness of the service fitness programs because DOD has not identified a common set of statistics needed to monitor fitness. As a result, the services could not provide basic information essential to understanding fitness in the military, including much of the statistical information the Assistant Secretary requested in the annual reports.



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Although available data limited comparisons across the services, comparisons made by GAO raised questions about the effectiveness of the fitness programs in two areas. First, failure rates in cardiovascular and muscular endurance tests appear to vary significantly among the services. For example, a 1995 Army study stated that the overall failure rate for that service was 12.5 percent. In comparison, the failure rates for the Air Force and the Marine Corps in 1997 totaled 4.6 and 1 percent, respectively. Second, the available data indicated that women consistently failed the fitness tests at a slightly higher rate than men. In 1995, 13 percent of Army women did not meet the cardiovascular and muscular endurance standards, whereas 11 percent of Army men failed the standards. Likewise, Air Force data showed that about 9 percent of its women did not meet the standards in 1997 compared with 4 percent of its men.

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## Recommendations

GAO recommends that the Secretary of Defense revise DOD's physical fitness regulations to

- clearly state that the objective of the military physical fitness program is to enhance general fitness and health and make clear that the program is not intended to address the capability to perform specific jobs or missions;
- establish clear DOD-wide policy for age- and gender-based adjustments to fitness and body fat standards, requiring all services to derive them scientifically, clearly document the basis used, and submit exceptions for approval;
- establish a DOD-wide approach, based on current scientific research, to estimating body fat percentages;
- establish a mechanism for providing policy and research coordination of the military services' physical fitness and body fat programs; and
- define the statistical information needed to monitor fitness trends and ensure program effectiveness, and require that this information be maintained by all services and provided in the currently required annual reports.

GAO also recommends that the Secretary of Defense take steps to ensure that the services implement the existing requirements that

- personnel be tested in all three areas cited in the regulation—cardiovascular endurance, muscular strength and endurance, and body composition and
- all servicemembers, regardless of age, be tested for fitness.

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## Agency Comments and GAO's Evaluation

DOD agreed with GAO's findings and recommendations and said that it had already begun actions to implement them. DOD noted that since 1996, the services have made progress in adjusting standards based on more objective data and have worked cooperatively to resolve research issues. Specifically, DOD said that it is revising its fitness program regulations to focus the purpose of the program on general fitness and health, and to create common DOD-wide standards for fitness and body fat evaluation and measurement. A number of the issues GAO raised remain under study, but DOD said it expected to publish revisions to the policies by the end of 1999. Furthermore, DOD said that developing standards for general fitness and health is a complex matter, where academic and research experts often differ on conclusions and research. DOD's comments are reprinted in their entirety in appendix I and are also summarized throughout the report where appropriate. DOD also provided technical comments concerning factual information in the report, and GAO has modified the report where appropriate.

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## Abbreviations

DOD	Department of Defense
GAO	General Accounting Office

# Introduction

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The number of women in the military has grown significantly in recent decades. Women now make up about 14 percent of active duty forces, up from about 2 percent in the early 1970s. Their role has also evolved from the traditional concentration in medical and administrative occupations; women are now eligible to serve in over 80 percent of all military jobs, including many air, sea, and other combat-related positions. The growing role of women has also resulted in debate within and outside of the Department of Defense (DOD) over fundamental and sometimes contentious issues, including whether physical fitness standards are fair and appropriate to both men and women. The Defense Advisory Committee on Women in the Services reported that men and women at military installations across the country are confused about the need for differing standards among the services, particularly those regulating body fat, and lack confidence in the fairness of the standards. In addition, the Rand Corporation recently reported that some military men believe that fitness standards have been adjusted to the point of being too easy for women.<sup>1</sup>

Physical fitness is a fundamentally important part of military life for all military personnel. DOD guidance requires that servicemembers pass physical fitness tests at least annually regardless of age and gender. Personnel who fail to meet fitness standards can be denied promotions, schooling, and other activities and may be forced to leave the military. In recent years, the downsizing of active duty forces and the increased rate of deployments and redeployments for peace operations and other activities have increased the physical demands on soldiers.

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## DOD's Physical Fitness and Body Fat Program

DOD's guidance, issued in 1981 and updated in 1995, requires that the services establish physical fitness and body fat programs, which include fitness requirements for all servicemembers. The program guidance states that individual servicemembers need to possess the cardiorespiratory endurance, muscular strength and endurance, and whole body flexibility to successfully perform in accordance with a service-specific mission and military specialty. However, the guidance does not identify requirements for specific activities or levels of difficulty. In addition, the guidance states that maintaining desirable body composition is an integral part of physical fitness, general health, and military appearance. The Assistant Secretary of Defense for Force Management Policy is responsible for oversight of the program and coordinating with the Assistant Secretary of Defense for

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<sup>1</sup>New Opportunities for Military Women: Effects Upon Readiness, Cohesion, and Morale, Rand Corporation, October 1997.

Health Affairs, who is responsible for establishing a health promotion program to be implemented in conjunction with the fitness and body fat program.

DOD guidance states that each service must develop its own program according to its particular needs, placing primary emphasis on maintaining general health and physical fitness. Evaluation of individual fitness is an integral component of the program. DOD Instruction 1308.3 sets out a number of key requirements for this evaluation, including the following:

- The services must use physical fitness tests of cardiovascular endurance, such as running a certain distance within a specified time limit, and muscular strength and endurance, such as sit-ups and push-ups.
- All servicemembers are to be tested regardless of age.
- Testing standards may be adjusted for age and must be adjusted for physiological differences between men and women.
- All servicemembers are to be formally tested for the record at least annually.
- Efficiency or fitness reports must include comments if the servicemember fails to meet physical fitness standards.

DOD's instruction also sets out body fat control policies and procedures. The instruction requires the services to use a two-tier screening process. If a servicemember exceeds the weight parameters for his or her height in a screening table or the member's immediate commander determines that his or her appearance suggests an excess of body fat, then the servicemember's percent of body fat is to be estimated. To standardize as much as possible, DOD requires the services to use similar validated circumferential equations for the prediction of body composition. The men's equation involves measurements of the neck and waist or abdomen. The women's equation requires measurement of the hips, waist, and neck, but allows for optional measurements of the abdomen and wrist, and/or forearm.

For both the fitness and body fat components of the program, servicemembers who fail to perform successfully against the established standards are to be given at least 3 months to improve. Servicemembers who have not progressed during that time are to be referred to medical authorities for further evaluation. If servicemembers continue to fail over time, they are to be considered for administrative separation under service regulations.

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## The Role of DOD Physical Fitness Standards Is to Maintain General Fitness and Health

Two kinds of physical performance requirements are placed on members of the military: job-specific physical performance standards that are applicable to particular occupations and general physical fitness standards that are applicable to all members regardless of their occupation. The purpose of job-specific physical performance standards is to ensure that those personnel assigned to physically demanding jobs are capable of performing the requirements of those jobs. On the other hand, the primary purpose of general fitness standards is to maintain the overall health and conditioning of personnel. As such, these standards are not intended to specifically enhance the performance of a particular service mission or job.

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## Job-Specific Physical Performance Standards

Section 543 of the Fiscal Year 1994 National Defense Authorization Act required the Secretary of Defense to prescribe physical performance standards for any occupation in which the Secretary determined that strength, endurance, and cardiovascular capacity was essential to the performance of duties. The act required that any such standards developed were to pertain to job activities that were commonly performed in that occupation, relevant to successful performance, and not based on gender. In other words, job-specific physical performance standards would identify the absolute minimum level needed for successful performance in those occupations. Anyone in that occupation, regardless of gender, would be required to meet the same standard.

In 1996, we reported on the development and use of gender-neutral occupationally specific performance standards in the military.<sup>2</sup> Neither the Navy nor the Marine Corps had adopted occupational strength standards. Although the Army categorized each enlisted occupational specialty into one of five categories based on physical demand, it discontinued testing recruits' physical capabilities to perform such activities in 1990 and had previously used the results of that testing only for counseling recruits about serving in certain occupations. The Air Force had categorized each of its enlisted occupations into one of eight physical demand categories. It used a strength aptitude test administered to recruits to screen out those who would be likely to have difficulty performing physically demanding jobs, but it did not incorporate the strength test into the required annual fitness evaluation for personnel in those jobs.

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<sup>2</sup>Physically Demanding Jobs: Services Have Little Data on Ability of Personnel to Perform (GAO/NSIAD-96-169, July 9, 1996).

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## Physical Fitness Requirements Linked to Health but Not to the Ability to Perform Military Tasks

The DOD physical fitness program involves more than just periodic testing against standards. Passing an annual fitness test is not synonymous with maintaining a high level of health and physical fitness. The research literature provides a large body of information linking physical activity to health and a variety of recommendations for the amount and intensity of exercise needed to achieve fitness. For example, organizations such as the American College of Sports Medicine and the Department of Health and Human Services recommend 20 to 60 minutes of cardiovascular exercises most days of the week at a moderate level of intensity—for example over 50 percent of the maximum heart rate—as well as resistance exercises to condition the major muscle groups for strength and endurance. Some groups also recommend exercises to maintain flexibility. Although these recommendations were directed at the general U.S. population, a 1998 National Academy of Sciences report recommended that DOD personnel follow a similar regimen.<sup>3</sup> DOD guidance recommends that servicemembers engage in regular physical fitness training of about 1-1/2 hours, three times a week. Duty time can be authorized for such training.

Research literature also supports linking body fat percentages, cardiovascular endurance, and muscular endurance to the overall health objective. For example, the 1998 report by the National Academy of Sciences indicates that increases in the percentage of body fat are associated with health problems and a decrease in some aspects of fitness. Individuals with excess accumulation of abdominal fat appear to be at increased risk for a number of diseases.

Research has identified little correlation between performance on timed runs, push-ups, sit-ups, and other fitness tests and specific military task performance. According to the 1998 National Academy of Sciences report, the majority of the military's physically demanding occupations involve occasional to frequent lifting and load carrying. However, the report found little association between performance on push-up, sit-up, and unloaded distance running tests, and lifting and load carrying ability. Researchers concluded that tasks, such as unloaded distance running, were rarely a part of a soldier's military duties and that the larger body type required to excel at lifting, for example, was different from the leaner body type required to excel at distance running.

The relationship between the percentage of body fat and task performance is more complex. Some research has found that the higher the percentage

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<sup>3</sup>Assessing Readiness in Military Women: The Relationship of Body Composition, Nutrition, and Health, National Academy Press, 1998.



of body fat the lower the performance in running tests. However, research also shows that women recruits who failed body fat standards were stronger than their counterparts who passed. This situation presents a dilemma for the military: setting a high body fat limit favors selection of women who are strong but may lack optimum endurance, and vice versa. The Academy's report pointed out that, to some degree, current body fat standards may discriminate against women who would be the most capable of performing jobs requiring strength, which might be the most critical for survival in a combat situation.

In addition, the 1998 report by the National Academy of Sciences, as well as an earlier report in 1992,<sup>4</sup> concluded that the "appearance" objective does not seem to be linked to performance, fitness, nutrition, or health. Research<sup>5</sup> conducted in 1990 explored this relationship by having a panel of military officers and enlisted personnel rate the military appearance of 1,075 male and 251 female Army personnel in uniform, and then comparing these judgments to measures of the percent of body fat for each participant. The results were only a "modest" correlation (0.53 for males, and 0.46 for females), and the report concluded that factors other than body composition, notably subjective judgment, influence appearance ratings. The National Academy of Sciences reports recommended that the military should develop objective criteria with which to judge appearance if it deems such a standard necessary.

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## Objectives, Scope, and Methodology

The Ranking Minority Member, Subcommittee on Readiness, Senate Committee on Armed Services, requested that we review a series of issues regarding the treatment of men and women in the military. This report discusses (1) the rationale for differences in difficulty among the military services physical fitness standards, (2) how the services adjust the standards for gender and age, and (3) DOD's oversight of the fitness program.

To assess the differences in the difficulty of fitness standards, adjustments to the standards for differences based on gender and age, and DOD oversight, we reviewed DOD directives and instructions, service regulations, manuals, and supporting documents; analyzed pertinent research and policy reports undertaken by DOD and a variety of

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<sup>4</sup>Body Composition and Physical Performance: Applications for the Military Services, National Academy Press, 1992.

<sup>5</sup>Relationships Between Body Fat and Appearance Ratings of U.S. Soldiers. Naval Health Research Center, Report No. 90-01, 1990.

independent civilian agencies; and discussed the results with officials and researchers from DOD, the military services, and the civilian agencies. We did not visit individual units to test the implementation of the guidance. To address the issues of DOD policies, service differences, and level of oversight, we interviewed officials from the Office of the Under Secretary of Defense for Personnel and Readiness, the Office of the Assistant Secretary of Defense for Force Management Policy, and the Defense Advisory Committee on Women in the Services. In the Army, we interviewed officials and researchers from the Assistant Secretary of the Army for Manpower and Reserve Affairs; the Office of the Deputy Chief of Staff for Personnel; the Army Physical Fitness School at Fort Benning, Georgia; and the Army Medical Research and Development Command at Fort Detrick, Maryland. We interviewed Navy personnel from the Bureau of Naval Personnel and the Naval Health Research Center in San Diego, California. We met with Marine Corps personnel from the Combat Development Command in Quantico, Virginia. To complete our work in the Air Force, we interviewed officials from the Office of the Surgeon General.

To gain additional perspectives on physical fitness programs, we reviewed various research and evaluation reports and interviewed officials from a variety of government and civilian organizations. These organizations included the National Academy of Sciences; the National Institutes of Health; the Centers for Disease Control and Prevention; the President's Council on Physical Fitness and Sports; the American Heart Association; and the Cooper Institute for Aerobics Research in Dallas, Texas.

We conducted our review between January and September 1998 in accordance with generally accepted government auditing standards.

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# Lack of Adherence to DOD Policy and Confusion Over Multiple Objectives Contribute to Differences in Service Requirements

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Physical fitness programs enacted by the services are a mixture of different requirements, lacking a clear rationale for marked differences in difficulty. In some cases, differences were due simply to failures to follow stated DOD policy, while in others, differences were due largely to confusion over program objectives.

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## Fitness Standards Differ by Service

The services differ significantly in the types of physical fitness tests they use and the minimum levels of performance required on those tests. These differences occur in all three testing areas—cardiovascular endurance, muscular strength and endurance, and body composition. However, all services adjust program standards for physiological differences between the sexes in all three testing areas, and for age in the case of cardiovascular and muscular strength and endurance standards. To simplify comparisons of the cardiovascular and muscular strength and endurance standards in the tables which follow, we used a baseline age of 45 for both men and women.

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## Cardiovascular Endurance Tests

As shown in table 2.1, fitness standards for cardiovascular endurance differ significantly by service in the type of test used and the minimum level of performance required. Standards for running activities varied in both the distance of the test run and the required maximum time for the run. For a 45-year-old servicemember, the Navy requires its men and women to run 1-1/2 miles within about 17 and 18 minutes, respectively; the Army requires a 2-mile run within about 19 and 24 minutes; and the Marine Corps requires a 3-mile run within 30 minutes for men and 33 minutes for women. The Air Force tests its personnel for cardiovascular endurance by measuring the body's oxygen consumption while riding a stationary bicycle.<sup>1</sup>

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<sup>1</sup>According to officials, the Air Force used the 1-1/2 mile run up until the early 1990s. However, after several personnel died, the decision was made to switch to the stationary bicycle test for safety reasons.

**Chapter 2**  
**Lack of Adherence to DOD Policy and**  
**Confusion Over Multiple Objectives**  
**Contribute to Differences in Service**  
**Requirements**

**Table 2.1: Service Standards for Cardiovascular Endurance for 45-Year-Old Personnel**

Exercise	Distance (in miles)	Maximum time allowed (in minutes:seconds)	
		Men	Women
Run/walk			
Army <sup>a</sup>	2	18:42	23:42
Navy <sup>b</sup>	1-1/2	16:30	18:15
Marine Corps	3	30:00	33:00
Stationary bicycle <sup>c</sup>			
Air Force	1-1/2	16:58	18:33

<sup>a</sup>These new standards were expected to become effective October 1, 1998. However, according to Army Physical Fitness School officials, implementation has been delayed until early January 1999 to allow for additional review and feedback from commanders, and to complete and distribute new fitness scorecard forms.

<sup>b</sup>This standard expected to become effective January 1999.

<sup>c</sup>Air Force standards are expressed in terms of approximate 1-1/2 mile run equivalents.

## Muscular Strength and Endurance Tests

The services differ in the types of tests used to assess muscle strength and endurance. The Air Force is the only service with no requirement for push-ups, sit-ups, or other tests of muscular strength and endurance. Air Force personnel acknowledged that the service is not in compliance with DOD's policy requiring such testing but could provide no explanation. According to a 1997 study of the Air Force fitness program<sup>2</sup> and DOD's 1981 report<sup>3</sup> on physical fitness in the military, muscular endurance exercises were included in the Air Force program as late as the early 1960s, but had been dropped by the early 1980s. The Air Force study, as well as a panel of experts, concluded that muscle strength and endurance training, such as sit-ups and bench and leg presses, should be added to the Air Force fitness program. According to Air Force officials, a plan to begin muscular strength and endurance testing in two phases during 1999-2000 has been endorsed by the Surgeon General's Office and is being reviewed by the Air Staff.

While the Army, Navy, and Marine Corps all use sit-ups to test muscular strength and endurance, the minimum number required to pass these tests varied significantly across the services. Once currently pending changes

<sup>2</sup>Expanded Air Force Physical Fitness Battery: Muscle Strength, Muscle Endurance, and Flexibility Considered: Volume I, Final Report; Crew System Ergonomics Information Analysis Center, October 30, 1997.

<sup>3</sup>Department of Defense Study of the Military Services Physical Fitness, April 3, 1981.

take effect, the minimum number of sit-ups required for a 45-year old man to complete within 2 minutes will be 32 in the Army, 45 in the Marine Corps, and 29 in the Navy. Both the Army and the Navy have a push-up requirement, but their standards also differed significantly. The Marine Corps uses pull-ups for men and flexed arm hang for women as its test of upper body strength and endurance. Table 2.2 shows the services' minimum standards for muscular strength and endurance.

**Table 2.2: Minimum Standards for Muscular Strength and Endurance for 45-Year-Old Personnel**

Exercise	Men	Women
<b>Sit-ups within 2 minutes</b>		
Army <sup>a</sup>	32	32
Navy	29	24
Marine Corps <sup>b</sup>	45	45
<b>Push-ups w/in 2 minutes</b>		
Army	30	12
Navy	20	5
<b>Pull-ups/flexed arm hang<sup>c</sup></b>		
Marine Corps	3	15 seconds

<sup>a</sup>Standard expected to become effective January 1, 1999.

<sup>b</sup>Navy and Marine Corps personnel are required to perform sit-ups with knees bent and hands folded across their chests. However, Army personnel perform sit-ups with knees bent and hands clasped behind the neck. Some officials believe folding the hands across the chest will reduce neck and lower back injuries, and allow better isolation of abdominal muscles.

<sup>c</sup>Marine Corps men are required to perform pull-ups, women Marines are required to perform a flexed arm hang. The flexed arm hang test consists of hanging from an elevated bar with feet off the ground and elbows flexed.

## Body Composition Tests

The services each use a two-tier body composition test, as required by DOD guidance. The first tier involves an initial screening in which servicemembers are required to pass a visual inspection for appearance and/or be measured against weight-for-height tables adjusted for gender. Table 2.3 shows that each of the services uses different weight-for-height values.

Chapter 2  
Lack of Adherence to DOD Policy and  
Confusion Over Multiple Objectives  
Contribute to Differences in Service  
Requirements

Table 2.3: Military Weight and Height Standards

Height in inches	Maximum allowable weight in pounds									
	Women					Men				
	DOD	Army	Navy	Marine Corps	Air Force	DOD	Army	Navy	Marine Corps	Air Force
64	160	145	156	138	146	170	160	162	160	164
65	164	149	160	142	150	174	165	167	165	169
66	168	154	163	147	155	178	170	172	170	174
67	172	159	167	151	159	181	176	177	175	179
68	176	164	170	156	164	185	181	182	181	184
69	179	168	174	160	168	188	186	188	186	189
70	183	173	177	165	173	192	192	192	192	194
71	187	177	181	170	177	196	197	196	197	199
72		183	185	175	182	200	203	201	203	205
73		188	188	180	188	205	208	206	209	211
74		194	192	185	194	210	214	211	214	218
75		200	195	190	199	215	220	216	219	224
76		206	199		205		226	221	225	230
77		211	203		210		232	226	230	236
78		216	206		215		238	231	235	242
79		222	210		221		244	236	241	248
80		227	213		226		250	241	247	254

Note: The Army, unlike the other services, relaxes its weight for height requirements as age increases. The Army weights listed are for soldiers age 40 and above. Table values are not adjusted for service differences in allowances for the weight of clothes and shoes, which range between 0-3 pounds, depending on the service. The Navy revised its weights in September 1998 to be more closely aligned with actual body fat percentage requirements.

If this initial screen is failed, then the servicemember must have their percentage of body fat determined using measures of the circumference of various body sites plugged into service equations that estimate the percentage of body fat. The purpose of the body fat calculation is to ensure that personnel with extra weight due to muscle (not fat) are not unfairly required to leave the military.

As shown in table 2.4, maximum allowable percentages of body fat vary considerably by service. The body fat percentage standards appear to bear little logical relationship to the weight-for-height values that are used as a body composition screening tool. For example, the maximum allowable Air Force weights are often higher than Army weights for a given height,

although the Air Force has more stringent body fat percentage standards than those of the Army.

**Table 2.4: Standards for Percentage of Allowable Body Fat**

Organization	Maximum standard (in percents)	
	Men	Women
DOD	18 to 26	26 to 36
Army	20—ages 17 to 20	30—ages 17 to 20
	22—ages 21 to 27	32—ages 21 to 27
	24—ages 28 to 39	34—ages 28 to 39
	26—ages 40 and older	36—ages 40 and older
Air Force	20—ages 29 and below	28—ages 29 and below
	24—ages 30 and older	32—ages 30 and older
Navy	22	33
Marine Corps	18	26

Note: The Navy increased its female maximum standard from 30 to 33 percent effective September 1, 1998.

## Confusion Over Program Objectives Contributes to Different Standards

DOD guidance states that the services should place primary emphasis on fitness programs that develop general health and physical fitness. However, they also state that the services should establish fitness requirements in accordance with their particular mission, incorporate job-specific standards into the programs, and implement body fat programs that enhance military appearance. Officials in all the services cited health and fitness as program objectives, but indicated the degree of emphasis on other objectives varied by service. Service officials told us that the inclusion of multiple objectives in the guidance created confusion regarding the main purpose of the program and that emphasis given to one or the other of these objectives differed by service, with the difficulty of the standards raised or lowered accordingly.

The Navy and the Air Force focused mostly on health as the program objective. Consequently, they tended to have relatively less vigorous standards than the Army and the Marine Corps, who placed additional emphasis on fitness and appearance. For example, Navy officials told us that they saw health as the appropriate objective of fitness programs, and their standards are set with that in mind. According to these officials, their maximum body fat standard of 22 percent for men is set at the clinical definition of obesity established by a National Institutes of Health panel in 1985,<sup>4</sup> since obesity is clearly related to health problems such as diabetes,

<sup>4</sup>National Institutes of Health Consensus Development Conference, February 1985.

hypertension, heart disease, and cancer. However, Navy officials stressed that the standard is an upper limit, and they encourage Navy personnel to remain well below this level. In comparison, according to Marine Corps regulations and officials, the Marine Corps relies on maximum physical fitness more than any other service. Accordingly, the Marine Corps established its male body fat standard at 18 percent, the lowest level of all the services.

Despite the apparent confusion, none of the services based its general fitness standards on specific combat mission or job requirements. However, at one time the Marine Corps administered a physical readiness test of combat skills, such as simulated marches uphill at a rapid pace, rope climbing to resemble entering and leaving a hovering helicopter, and evacuation of a wounded comrade by sprinting 50 yards, lifting another Marine onto the shoulders, and returning to the starting point. That test has been discontinued as an evaluated test for individuals, but units such as the Marine Corps Officer Candidates School continue to conduct the test as a training tool. Marine Corps officials were unsure as to when and why the individual test was discontinued. Officials at the Army Physical Fitness School also told us that they have been studying development of a combat fitness test for infantry soldiers. The test could include exercises such as a 3-mile march carrying a 40-pound pack, a weapons qualification test, and an obstacle course. The specific tasks would be linked to a unit's mission-essential task list. If these kinds of job-specific physical standards are developed, DOD guidance calls for them to be incorporated into the service's physical fitness program. Such job-specific standards would then augment the general fitness standards for personnel in those specific occupations but would not supplant the requirement for periodic testing against the general fitness standards.

Officials from only two services, the Army and the Marine Corps, cited "appearance" as one of their physical fitness program objectives. They indicated that image is an important aspect of effectiveness, and because the image of a soldier is one of leanness, an excessively fat appearance could weaken the military image and undermine effectiveness. Navy officials, told us that appearance is not an appropriate objective of body fat programs. However, Navy body fat results are used to determine an individual's rating in the "military bearing" category on officer fitness reports and enlisted personnel evaluations.

Although the references to additional objectives in the guidance has apparently led to some confusion, the Office of the Secretary of Defense



official responsible for overseeing the fitness program stated that physical fitness standards are intended only to set a minimum level of general fitness and health for military personnel and are not directly related to job performance. This distinction between general fitness standards and job-specific physical performance standards was also set forth in a 1995 DOD report to the Congress on gender-neutral performance standards.<sup>5</sup>

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## Recommendations

In order to clarify the purpose of the physical fitness program, we recommend that the Secretary of Defense revise DOD's regulations to (1) clearly state that the objective of the physical fitness program is to enhance general fitness and health and (2) make clear that the program is not intended to address the capability to perform specific jobs or missions.

We also recommend that the Secretary of Defense take steps to ensure that all services implement testing in all three areas cited in the regulation—cardiovascular endurance, muscular strength and endurance, and body composition.

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## Agency Comments and Our Evaluation

DOD agreed with our recommendations and said that its joint service working group had reviewed DOD policy and the findings of the National Academy of Science's 1998 report and determined that DOD's policy should focus on general health and fitness. According to DOD's response, preliminary actions are underway to revise policy documents to clarify that the objective of the program is to enhance general fitness and health, and to explain that the policy is not designed to address specific job or mission performance. DOD also agreed to require that all services test their personnel in cardiovascular endurance, muscular strength and endurance, and body composition. DOD further noted that these actions do not preclude it from establishing policies related to occupational or mission fitness needs, if such policies are needed.

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<sup>5</sup>Gender Neutral Standards, Report to the House Committee on National Security, Senate Committee on Armed Services, and House and Senate Committees on Appropriations, by the Office of the Assistant Secretary of Defense (Force Management Policy), April 1995.

# Inconsistent and Sometimes Arbitrary Standards Create Potential Gender and Age Inequities

Service rationales for adjustments to the fitness standards were often different for men and women. This leads to questions about the fairness of standards applied to men and women. Some adjustments were not based on scientific data, and many were poorly documented. Efforts are underway to correct some of these problems and ensure that a consistent, science-based approach is used in setting standards for both genders. The approaches used to calculate the percentage of body fat are also inconsistent and outdated, further undermining the usefulness of the standards. Researchers found that service equations predict different body fat values when applied to the same woman, the subject population used to develop the equations is becoming increasingly less representative, and existing calculation approaches do not account for racial differences in bone density. The National Academy of Sciences has called for major changes to the program. In addition, DOD guidance states that all servicemembers, regardless of age, will be tested for cardiovascular and muscular endurance. However, the Navy and, until recently the Marine Corps, have exempted senior personnel—ages 50 and older and 46 and older, respectively—from such testing for years. The Air Force and the Army adhere to DOD's policy to test servicemembers throughout their careers.

## Adjustments to Fitness Standards for Age and Gender Are Appropriate

The 1992 President's Commission on the Assignment of Women in the Armed Forces looked closely at the issue of physical strength and endurance requirements. The Commission concluded that, since physical fitness standards are established to promote the highest level of general wellness in the armed forces and are not aimed at assessing capability to perform specific jobs or missions, it is appropriate to adjust the standards for physiological differences among service members.<sup>1</sup> Although DOD policy allows adjustments to the fitness standards based on age and requires adjustments based on the physiological differences between genders, the approach to adjusting the actual standards is generally left up to each service.

DOD's current policy allows the services to set different minimums according to age to account for the physiological changes and diminished physical capabilities experienced as people age. However, DOD requires that all personnel, regardless of age, be tested against cardiovascular and muscular endurance standards at least annually. This policy dates back at least to the 1981 DOD report assessing military fitness programs. The report

<sup>1</sup>Report to the President, Presidential Commission on the Assignment of Women in the Armed Services, 1992, p. 5.

stated that exempting personnel from fitness testing at a certain age implied that fitness was not important after that point and diluted the involvement and support of senior leaders. Mandatory testing was viewed as a potential catalyst for change and more leader involvement and support of physical fitness. In contrast, some DOD personnel believe that requiring older personnel to meet fitness standards will result in the loss of senior leaders over time.

Reports by the National Academy of Sciences and others indicate that, in addition to generally being smaller, female soldiers demonstrate only 50 to 70 percent of male's strength, with the greatest disparity in the area of upper body strength. Women have smaller lung capacities and hearts than men. Women also carry about 10 percentage points more body fat than men and accumulate the fat in different places. As a result of these and other differences, women exerting the same effort as men in running, push-ups, and other cardiovascular and muscular strength and endurance tests are generally at a disadvantage.

To reflect these and other gender-based physiological differences, DOD guidance directs that testing standards be adjusted. The guidance does not specify the degree of adjustment required in the case of cardiovascular and muscular strength and endurance standards. DOD guidance cites an acceptable body fat range of 18 to 26 percent for men and 26 to 36 percent for women. However, the guidance authorizes the services to establish more stringent standards based on service needs or mission but require an 8 to 10 percentage point difference (as is reflected in the DOD minimum and maximum allowable body fat percentages) between male and female body fat standards. The guidance also states that the services may not derive, extrapolate, or adjust female body fat standards using data from male subjects, and vice versa. DOD officials said that these body fat policies are intended to ensure that service standards are based on the results of objective, gender-specific scientific research. The officials also told us that the prohibition against inferring one gender's standard from the other's, while contradictory to the requirement for an 8 to 10 percentage point difference, is in place because simply inferring differences is not an adequate approach to setting standards. Some officials believe that the prohibition against inferring standards should apply to all physical fitness standards and not just the body fat standards. DOD officials could provide no explanation for why there is no comparable restriction on how the other female fitness standards are set.

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## The Extent of Adjustment for Gender Differences Varies by Service

Each service established different standards for cardiovascular endurance by gender allowing female servicemembers more time to complete the same distance. The degree of gender difference varied by service. For example, in the case used in table 2.1, a 45-year-old woman is allowed 9 percent more time than a man in the Air Force, 10 percent more time in the Marine Corps, 11 percent more time in the Navy, and 27 percent more time in the Army.

The three services that test muscular strength and endurance<sup>2</sup> make gender-based adjustments to some standards in that area, but not others (see table 2.2). Only the Navy currently relaxes its sit-up requirements for women, allowing 45-year-old women to complete about 17 percent fewer sit-ups than their male counterparts. In 1997, the Marine Corps changed its sit-up standards to require identical performances from men and women. The Army is also expected to change to identical sit-up standards in January 1999. These changes are consistent with research indicating that women may equal or exceed male performance in sit-up tests. The Navy is currently conducting a study of fitness scores across the entire service, and officials expect the sit-up standards to also change once the results are analyzed.

With regard to push-ups, both the Army and the Navy adjust the standards for gender differences—the female standard in the Army is 60 percent lower than the male standard, and the female standard in the Navy is 75 percent lower than the male standard. The degree of gender adjustment in the Marine Corps cannot be assessed, since it uses different tests for men (pull-ups) and women (flexed arm hang).

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## Gender Adjustments to Physical Fitness Standards Vary and Are Not Based on Scientific Rationales

One prevalent approach to determining appropriate differences in fitness standards is through the use of statistics on the distribution of actual performance scores. In this approach, the services analyze data on the actual performance of males and females within their own service in push-ups, sit-ups, running, and other fitness tests. Minimum and maximum standards may then be set at a particular percentile of performance. According to service researchers, this approach is modeled after the use of bell curves, indicating the performance of students relative to one another, to assign grades in the education sector.

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<sup>2</sup>As noted in chapter 2, the Air Force physical fitness program does not test men or women for muscular strength and endurance.

The rationale for current or pending female fitness standards, however, have been different from males' in at least two of the military services. Male standards were usually based on actual data on their performance in the run, push-ups, or other such tests. However, female standards were often estimated, inferred from male data, or based on command judgment rather than actual performance in fitness tests. Also, the rationale for the standards was poorly documented in most services.

Navy standards for the 1-1/2 mile run/walk, push-ups, and sit-up exercises for men and women 30 years old and above are based on the distribution of actual scores for Navy men and women identified in Navy research reports. According to Navy officials, minimum requirements are set at the 10th percentile and maximums at the 90th to 95th percentiles. However, 1-1/2 mile run standards for women under 30 years old were set by adding time to the men's standards and not by using actual women's run times. Effective September 1998, the maximum time allowed for women under 30 to complete the 1-1/2 mile run was lowered by as much as 1 minute 15 seconds. The new female standards were derived by multiplying the men's standards by a factor to reflect the mean 18-percent difference between male and female aerobic capabilities, as calculated by Navy researchers, rather than using actual performance data. According to Navy documents and discussions with officials, this change was made because officials believed that the existing 4-minute difference between male and female standards in certain categories was not appropriate and that female standards needed to be more stringent. According to Navy officials, this change is temporary pending completion of an ongoing study of fitness scores throughout the Navy. The standards for males and for females ages 30 and older were not changed.

Marine Corps officials believed that their male standards dated back to studies conducted in 1967 showing actual male times for the 3-mile run, with minimums set at the 10th percentile and maximums at the 90th. In January 1997, the Marine Corps raised the female run distance from 1-1/2 to 3 miles to match the male requirement. According to Marine Corps officials, studies conducted in 1993 and 1996 revealed an approximate 3-minute difference, on average, between the male and female run times. The resultant female standards were then established by adding the 3-minute average difference to the existing male standards. Marine Corps officials stated that, although the data needed to provide actual performance times was developed to ensure a solid basis for the new female standards, the process described above was used.

A 1995 study by the Army<sup>3</sup> concluded that its current physical fitness program contained gender disparities, with some women's standards being less demanding than they should be, and not based on scientific research. For example, according to the report, research indicates that women's world record times for events similar to the 2-mile run are 8 to 12 percent slower than men's, but Army standards allow women to run 19 percent slower than men and still get the same score. Similarly, research found that women performed sit-ups at 95 to 110 percent of the male rate, but Army standards required women to perform at only 93 percent of the men's standards. Officials at the Army Physical Fitness School could not fully document the rationale behind the standards. They believed that the minimum requirements were based on actual data collected in the early 1980s, but the incremental steps up to the maximum scores were based on simple numerical progressions, not actual performance data. For example, according to Army officials, the difference between the minimum and maximum requirement in the 2-mile run was set at exactly 4 minutes, regardless of gender or age group. Additional points above the minimum were awarded for every 6 seconds shaved off the minimum requirement. In the two youngest age groups, women's requirements were exactly 3 minutes slower than men's.

Beginning in October 1998, the Army was scheduled to implement new standards based on a more scientifically based approach, with a gender neutral "equal points for equal effort" policy. The new minimum requirements are generally based on the 8th percentile of a sample of actual scores collected by the Army's 1995 study, the maximums on performances at the 90th percentile, and both requirements are gradually reduced in 5-year increments as age increases.<sup>4</sup> The new standards generally toughen the requirements for both sexes, requiring women to perform the same number of sit-ups as men, female run times to be set about 14 to 16 percent slower than male times, and female push-up requirements to increase from 44 to about 50 percent of the male standards. According to the Army study, these changes are consistent with a narrowing physical performance gap between the genders in recent years. The Army now plans to implement these new standards in January 1999.

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<sup>3</sup>Army Physical Fitness Test Update Survey, 1995.

<sup>4</sup>According to Army officials, in cases where the data from the samples showed abnormally high values or fell below existing minimums, the standards were manually adjusted from the 8th and 90th percentiles. However, in no case were the female standards based on adjustments from the male baselines.

Air Force officials could provide no studies or other records to document the rationale for their cardiovascular endurance or body fat standards. However, according to Air Force officials, an oral history of the standards was developed through discussions with officers previously responsible for the program. According to the oral history, the cardiovascular standard was based on performance statistics from a population of Air Force men and women in the early 1990s. Researchers recommended that the minimum standard be set at the 20th percentile of performance because that was the point with the largest incremental gain in health benefits between percentile groups. However, Air Force officials wanted a higher standard for readiness reasons: as a result the next percentile grouping up, the 40th percentile, was selected as the minimum standard. Female standards were set the same way and at the same level.

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## Gender Adjustments to Body Fat Standards Vary and Are Not Based on Scientific Rationales

Experts indicate that it is appropriate to base gender-specific body fat standards on studies of the level of fat found in populations of physically fit men and women or on life insurance actuarial studies of the weights for heights associated with long life and good health. However, at least two services, the Army and the Navy, based their female body fat standards on different rationales than the male standards. Officials from DOD and the other services could not clearly document the basis for the standards.

DOD's original body fat standards were established in 1981 based on the recommendations of the study panel chartered to report on physical fitness in the military. According to the National Academy of Sciences' 1998 report, the study panel recommended that both the male and female body fat standards be based on scientific texts indicating that the average body fat of physically fit young men was 20 percent and about 30 percent for fit young women, including a 5-percent margin for statistical error. DOD's guidance incorporated the 20-percent goal for men but lowered the female goal to 26 percent. According to the Academy's report, DOD decreased the female goal "in the belief that it was desirable to recruit women whose body fat was closer to that of the average man, as such women, possessing a higher than average proportion of fat free mass, might also be more similar to men in strength and endurance."

DOD's original body fat standards were in effect until 1995, when they were changed to the current level of 18 to 26 percent for men and 26 to 36 percent for women. DOD officials had no documentation of the rationale for the change. However, service officials told us that the change was based simply on the desire to cover the full range of standards in effect in

the services at the time and that no scientific research was conducted. Similarly, the weights listed in DOD's screening tables for body fat (see table 2.3) are based on the National Institutes of Health 1985 definition of obesity, or 120 percent of certain weights-for-height identified in actuarial tables produced by the Metropolitan Life Insurance Company in 1983. However, we could find little agreement between DOD's tables and the Metropolitan Life tables they are supposed to match.

Until September 1998, Navy regulations based male and female body fat standards on different rationales. The male standard is based on the 1985 National Institutes of Health definition of obesity. Navy scientists converted the 1983 Metropolitan Life weight-for-height values into mean body fat percentages of about 22 percent for males and 33 percent for females, and recommended these percentages be adopted as maximum Navy body fat standards. The recommendation for males was adopted without change. However, according to discussions with Navy officials, command concerns about appearance resulted in lowering the female standard to 30 percent. The Navy revised its regulations in September 1998 to raise the female standard back to the 33 percent originally recommended.

Marine Corps officials could not document a clear, scientific basis for either its male or female standards. However, based on our discussions with Marine Corps officials and review of regulations, the Marine Corps body fat standards appear to be based on command judgments regarding fitness and appearance, rather than health based actuarial studies or other scientific bases, although some limited research appears to have been considered. For example, Marine Corps regulations<sup>5</sup> state that, more than any other service, the Marine Corps relies on the maximum fitness of its personnel. As a result, according to the regulation, the maximum allowable percentage of body fat for male Marines was set at 18 percent. This equates to just below the midpoint of the interval between the 10-percent body fat level said by the regulation to be exhibited by marathon runners and the 30-percent level said by the regulation to represent gross obesity. Similarly, the regulation sets the female standard at 26 percent, or about 80 percent of the way up the interval between the 11-percent body fat level said by the regulation to be exhibited by average gymnasts and the 30-percent level said by the regulation to represent gross obesity in women.

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<sup>5</sup>Marine Corps Order 6100.10B, March 26, 1993.



The Army's current body fat standards of 20 to 26 percent for men and 30 to 36 percent for women, according to research cited in the 1998 National Academy of Sciences report and our discussions with Army officials, are based on different rationales. The 20-percent male minimum is based on Army data on young male soldiers dating back to the 1980s. The 26-percent male maximum was a result of increasing the 20-percent minimum figure by 2 percentage points roughly for every 10 years of age to accommodate increases associated with aging. The Army's current female standards were established in 1991. Prior to that year, the female standards were 28 to 34 percent, which Army officials told us were determined simply by adding 8 percentage points to the male minimum for each age category. The female standard was also viewed as unfairly restrictive compared with the men's standard. For example, an Army study found that the standard provided young women only a 1-to-3 percentage point margin over the mean body fat for young female recruits, while the men's standard provided a 4-to-6 percentage point margin over the mean for young male recruits. In 1991, the women's standard was increased by 2 percentage points for each age grouping, raising it to the current level of 30 to 36 percent.

Air Force officials could not determine the basis for their body fat standards. Consequently, they were also unable to tell us the basis for adjustments to the standards for gender.

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## Procedures for Determining Body Fat May Not Accurately Account for Gender and Racial Differences

The basic approach used by each service to determine the percentage of body fat has been to first develop a set of measures of the circumference of various body sites, such as the waist and neck for men, and the neck, waist, and hips for women. Next, these measures are entered into gender-specific equations developed by each service to estimate the percentage of body fat. These equations were developed through analysis of population samples for relationships between measures of various body sites and the percentage of body fat, as validated against underwater weighing techniques.

Researchers found, however, that this approach yields consistent results across the services for men, but not women. According to service researchers, men have basically one body type, whereas women have a variety of body types. The female body fat equations do not adjust well for the variety of female body types and thus do not consistently provide accurate predictions of the percentage of body fat. The three different body fat equations used by the services can result in different percentages

of body fat when applied to the same woman. For example, a test we conducted found that the estimates for percentage of body fat for the same woman was 42 percent using the Army equation, 29 percent using the Navy and Air Force equations, and 27 percent using the Marine equation. The use of different equations producing such wide variation in estimates can result not only in inequities, but also in outcomes that are inconsistent with the intended objective. For example, even though the Marine Corps set its body fat standards at the most stringent level of any service, the equation it uses resulted in the lowest estimate of body fat of all the services.

Researchers also report that the populations of active-duty soldiers used to validate the equations have, over time, become less representative of the ethnic and age diversity of the current military population. The Army's female equation, for example, was validated largely on a Caucasian population because of problems in underwater weighing of African American and Hispanic subjects, many of whom withdrew from the testing because they could not swim. According to the National Academy of Sciences' 1998 report, because the percentage of female and non-Caucasian soldiers is increasing, and the average age of female soldiers is also increasing, the subject population used to develop and validate the equations is becoming increasingly less representative. Table 3.1 shows the ethnicity of U.S. servicemembers as of the end of fiscal year 1997.

**Table 3.1: Ethnicity of U.S. Military Enlisted Personnel 1997**

Ethnicity	Percentages							
	Army Men	Army Women	Air Force Men	Air Force Women	Navy Men	Navy Women	Marine Corps Men	Marine Corps Women
White	59.6	40.5	75.9	64.7	66.1	54.6	67.9	57.2
Black	26.7	46.8	15.6	25.5	18.0	30.5	16.3	24.6
Hispanic	7.2	6.0	4.7	5.1	8.4	9.4	11.5	12.7
Other	6.5	6.7	3.7	4.7	7.5	5.5	4.2	5.6

Note: Column totals may not add to 100 percent due to rounding.

Source: DOD.

The National Academy of Sciences' 1998 report also concluded that the service equations are outdated because they fail to adjust for heavier bone densities in minorities. In the past, all services compared the results of

their body fat equations with underwater weighing methods as a reference to check for accuracy and standardization. These techniques were based on so-called two-compartment models, which partition body weight into two basic components: fat and fat free mass (defined as the difference between body weight and fat mass). However, two-compartment models do not account for racial differences in bone density, thus potentially overstating the weight of minorities. In contrast, newer four-compartment models measure bone mass, total body water, body weight, and body volume, in part based on underwater weighing techniques. The Academy's report concluded that agreement now exists that four compartment models have been developed over the past decade that are superior to the earlier two-compartment models. The Marine Corps was the first to base its equations on the newer four compartment models, beginning in October 1997. Navy researchers are currently developing equations based on four-compartment models for the remaining services.

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## Policy Requiring Testing at All Ages Not Followed

DOD guidance states that all servicemembers regardless of age will be tested for cardiovascular and muscular endurance. However, the Navy has exempted personnel age 50 and older, and the Marine Corps personnel age 46 and older, from such testing for years due to concerns about retaining senior leaders. In contrast, members of the Army and the Air Force are tested throughout their careers, in accordance with DOD policy. These inconsistencies can create significant inequities. For example, a 50-year-old, 70-inch tall Army male needed to weigh 192 pounds and complete sit-ups, push-ups, and a 2-mile run within specified timeframes to stay in that service. However, until recently, a Marine Corps male of the same age and height would have had to maintain a similar weight, but would not have to pass any cardiovascular endurance or strength tests to remain in the Marine Corps. The Marine Corps recognized that its fitness testing policy did not comply with DOD guidance and therefore changed the policy in July 1998, requiring that Marines of all ages pass tests in distance running, sit-ups, pull-ups, and the flexed arm hang. Navy officials believed that their fitness testing policy would also be changed, pending the results of an ongoing review.

There is also disagreement over whether to relax body fat standards as servicemembers age. All services relaxed their cardiovascular and muscular endurance standards as service personnel age. However, the Navy and the Marine Corps did not carry this policy over to body fat standards. Older members of those services must meet the same body fat standards as the youngest members of their respective services. In

contrast, the Army allows a 6-percentage point increase, and the Air Force a 4-percent increase, as their men and women age. This difference can be significant. For example, a 20-year-old female weighing 130 pounds would be allowed to gain about 8 pounds of fat by the age of 40 in the Army, while in the Navy and the Marine Corps no increase would be allowed. For a 20-year-old male weighing 200 pounds the difference would amount to about 12 pounds. DOD guidance allows relaxation of the cardiovascular and muscular endurance standards with age, but do not address this issue in the case of body fat standards.

Army officials argued that it is realistic to reduce body fat standards as personnel age, but Navy officials argued that relaxing the standards implies that health is less important as men and women age. Researchers acknowledge that weight becomes progressively more difficult to maintain with age. There is a gradual loss of muscle mass as one ages, which may be replaced with fat over time. Nonetheless, consistent with a focus on good health, neither the 1998 National Academy of Sciences report nor the 1995 federal Dietary Guidelines for Americans found justification for allowing an increase in body weight with age.

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## Recommendations

While some flexibility and discretion should be available to the services in setting their physical fitness policies, all of the services should follow clear and consistent policies and adjustments for age and gender should be scientifically based. Therefore, we recommend that the Secretary of Defense revise the physical fitness guidance to

- establish clear DOD-wide policy for age- and gender-based adjustments to general fitness and body fat standards, requiring all services to derive them scientifically, clearly document the basis used, and submit exceptions for approval and
- establish a DOD-wide approach, based on current scientific research, to estimating body fat percentages.

We also recommend that the Secretary of Defense take steps to ensure that the services adhere to the policy requiring physical fitness testing of all servicemembers, regardless of age.

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## Agency Comments and Our Evaluation

DOD agreed with our recommendations. It said that it was already analyzing revisions to the standards: that considerations of age and gender will be required to be scientifically derived, with any exceptions to the

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**Chapter 3**  
**Inconsistent and Sometimes Arbitrary**  
**Standards Create Potential Gender and Age**  
**Inequities**

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policy submitted to the Secretary for approval; and that the services will be required to provide a statement in the annual fitness report that they are testing all military members, regardless of age. DOD also said that it has been working toward establishing a single approach to body fat measurement and that a change to establish a DOD-wide approach to estimating body fat will be included in the revised fitness and body fat policy to be completed by the end of 1999.

# DOD Oversight of the Physical Fitness Program Is Inadequate

Physical fitness oversight problems have persisted in DOD without resolution for a considerable period of time. Moreover, DOD has not enforced the annual reporting requirement or identified a common set of statistics needed to assess fitness. Consequently, it is unable to assess the effectiveness of the program. Comparisons of limited data we were able to obtain raised questions about program effectiveness. Failure rates among the services appear to be markedly different, with women failing at significantly higher rates than men. In addition, concern about the fitness of recruits and younger servicemembers is increasing.

## Problems Have Persisted for Years

Problems, such as confusion over multiple fitness program objectives and failure to enforce key policy requirements, have persisted since at least the early 1980s. For example, Army research<sup>1</sup> traces confusion between health and military performance objectives to the 1981 DOD Study of the Military Services Physical Fitness. This study acknowledged the benefits of designing programs with a health objective, but concluded that the goal of military physical fitness programs should be to make military personnel as fit for combat as possible. DOD's 1981 Physical Fitness and Weight Control directive stated that physical fitness is essential to the general health of military personnel and that primary emphasis should be placed on programs that maintain physical fitness. However, the guidance also stated that ideally, physical training should be designed to develop physical skills needed in combat. Similarly, DOD's requirement that all personnel, regardless of age, be tested for physical fitness is clearly spelled out in DOD's 1981 directive, and DOD's 1981 report on fitness in the military notes that the Navy and the Marine Corps were already exempting older personnel from fitness testing at that time. The requirements for each service to evaluate both cardiovascular and muscular endurance and provide annual reports that assess the program can be traced back at least to the 1995 version of the fitness guidance. However, the Air Force had stopped testing for muscular endurance by the early 1980s, and at the time of our fieldwork, none of the services had ever provided the required annual program reports.

Officials from the Office of the Assistant Secretary of Defense for Force Management Policy said that they were aware of the problems with the physical fitness and body fat instructions and directives as well as noncompliance with DOD policies. According to these officials, a joint service working group has been examining these problems since the summer of 1996. However, the officials cited two factors delaying

<sup>1</sup>Body Composition and Military Performance: Origins of the Army Standards; Karl E. Friedl, 1992.

corrective action. First, there was little consensus among the working group on the usefulness of existing research for resolving DOD fitness policy issues. As a result, it was deemed prudent to wait until the National Academy of Sciences completed its study on body fat policies before revising DOD policy. Second, the office that monitors the services' fitness programs has multiple responsibilities and frequent personnel turnover, and has no resident technical expert in exercise physiology, all of which limit the office's capability to quickly resolve such complex issues.

Similar problems, however, were identified in DOD's 1981 report on fitness programs. For example, the report found that, compared with other programs, physical fitness received little emphasis or resource commitment in DOD, and there was a lack of fitness-related research and qualified professional leadership and personnel with professional degrees in physical fitness. The report provided a number of recommendations to improve DOD management of physical fitness, including one for the Office of the Secretary of Defense to establish a DOD Committee for Physical Fitness to provide coordinated and continuing review and evaluation of the services' physical fitness programs and research. In 1985, DOD established a Joint Committee on Fitness to establish internal operating objectives for service fitness programs and function as a focal point for the exchange of policy, program, and research information. However, according to DOD officials, this committee stopped meeting and has been inactive for some time. These officials were unsure of the specific time or reasons the Committee stopped meeting.

DOD officials told us that action to correct some of these problems has begun. For example, according to DOD, initial agreement has been reached to continue to study implementing one body fat equation for men and one for women across all services. Additional recommendations contained in the National Academy of Sciences' report are still being reviewed, but drafting of policy revisions is planned for the fall of 1998. DOD officials also acknowledged that enforcement of the annual reporting requirement could have provided a useful monitoring mechanism. After our discussions, the Office of the Assistant Secretary of Defense informed the services by memorandum dated March 24, 1998, that they would now be required to provide the annual reports. By September 1998, all of the services had provided the initial reports. DOD and service officials also noted that the DOD fitness program could benefit from the reestablishment of a joint fitness committee at the Secretary of Defense level to help steer and accept policy recommendations.

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## DOD Cannot Determine Overall Fitness of Military Personnel

DOD has not defined the basic information needed to monitor the fitness of military service personnel. For example, information, such as the number of annual failures and the characteristics of those who fail, the results of remedial programs, and the number and characteristics of those who are separated each year for failure to meet fitness standards, are key to understanding the program. However, the services could not consistently provide this information. Similarly, the 1981 DOD report on fitness in the military also reported that the services could not accurately assess the fitness of their personnel and called for systems to be established to monitor and measure program effectiveness.

DOD and the services maintain a variety of statistics to describe various aspects of the physical fitness programs. However, this information is difficult to compare across services and time periods to provide meaningful conclusions about the level of fitness in the military. Differences in comprehensiveness, in the way in which data is aggregated, or other problems create comparison problems. For example, according to officials, the Army does not maintain a servicewide data base on physical fitness test results. The responsibility for maintaining this information is decentralized to the unit level. Further, Navy officials told us that they do not separate their data by gender, so comparisons of male and female performance against the standards are not available. Other problems included unreliable information due to unit underreporting, results not separated to identify other key characteristics such as rank, or data on recent years not available due to system changes. As a result of these problems, we were unable to determine and compare fitness and body fat failure rates over time, separation rates due to repeated failures of the fitness standards, and other such key information.

According to service officials, most fitness-related separations result from failure to achieve the body fat standards. For example, as shown in table 4.1, an average of about 4,600 enlisted personnel were separated during 1996 and 1997 for failing body fat standards. Data on officers was not consistently available. The number of personnel separated due to failures of the cardiovascular and muscular endurance standards was generally not available, but service officials believed that the number was relatively small.



**Table 4.1: DOD Separations of Enlisted Personnel for Failure to Meet Body Fat Standards, 1996-97**

Service	1996	1997
Army	2,123	1,945
Navy	1,956	1,692
Air Force	511	601
Marine Corps	204	209
<b>Total</b>	<b>4,794</b>	<b>4,447</b>

Source: Military service records.

Although available data cannot be directly compared across services, our comparisons of limited available data raised questions about the effectiveness of the fitness programs. For example, data provided to us by the services indicates that failure rates in cardiovascular and muscular endurance tests are markedly different. A 1995 study by the Army Physical Fitness School found overall officer and enlisted failure rates at 12.5 percent. In comparison, failure rates in the Air Force totaled about 4.6 percent during 1997 and failure rates in the Marine Corps totaled about 1 percent, based on 1997 data. The reason for the large differences is unclear. For example, the Marine Corps appears to have the most difficult standards, but its failure rate appears to be the lowest. Available data on body fat failures showed somewhat less pronounced differences. For example, during 1997 nearly 5 percent of Army officers and enlisted personnel had their personnel records flagged for being overweight. In contrast, as of March 1998, about 2 percent of Air Force personnel were in weight management programs.

Service data also indicated that women consistently fail the fitness standards at slightly higher rates than men. For example, the data cited above indicates that Army women failed the cardiovascular and muscular endurance standards at a 13-percent rate in 1995, while men failed at an 11-percent rate. Air Force data indicates that in 1997, women in that service failed in 9 percent of the cases, while men failed in 4 percent. Based on 1997 data, Marine women failed at a rate of 1.1 percent, while male Marines failed at a rate of 0.8 percent. Available data on the results of the body fat test was consistent with this trend. For example, Army data for 1997 showed that female Army personnel failed in about 6 percent of the cases, while Army men failed in about 5 percent of the cases. As of March 1998, about 4 percent of Air Force women were in weight management programs versus 2 percent of men.

Officials also raised concerns about the lack of fitness of recruits and younger servicemembers in recent years. For example, the fitness of career soldiers was viewed as satisfactory, but the 1995 Army Physical Fitness School study found that 32 percent of women and 27 percent of men aged 17 to 21 failed the fitness test. By 1997, according to Army Physical Fitness School officials, a similar study found the failure rate was 55 percent of women and 38 percent of the men. Similarly, data provided by the Marine Corps showed that physical fitness test scores for incoming male and female recruits at one location were between 10 and 7 percentage points, respectively, lower in 1996 than in 1992. Officials in both services believed the trends were due to the increasing lack of fitness in our society. In the early 1960s, national health surveys found that about 24 percent of Americans ages 20 to 74 were overweight. However, according to a recent report by the National Institutes of Health, about 55 percent of the U.S. population is now considered overweight or obese. The reasons for the increase are unclear. Some have pointed to an increasingly sedentary lifestyle, with more focus on computers and electronic games, and less time spent exercising or playing sports. Others have pointed to social or cultural changes. Officials in both the Army and the Marine Corps, however, believe that training was able to improve the fitness of these personnel as they progressed through military life. Officials in the Navy and the Air Force were unsure whether the same problem was occurring in their services.

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## Recommendations

We recommend that the Secretary of Defense revise the physical fitness guidance to

- establish a mechanism for providing policy and research coordination of the military services' physical fitness and body fat programs and
- define the statistical information needed to monitor fitness trends and ensure program effectiveness, and require that this information be maintained by all services and provided in the currently required annual reports.

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## Agency Comments and Our Evaluation

DOD agreed with each recommendation. It said that the joint services working group provides the nucleus of a body of experts that can advise DOD policymakers on research and policy issues and that it is currently studying the best way to formalize the mechanism we called for. This mechanism, as well as the statistical information needed to monitor

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**Chapter 4**  
**DOD Oversight of the Physical Fitness**  
**Program Is Inadequate**

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program trends and effectiveness, is to be included in the upcoming revision to DOD fitness policy.

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**Chapter 4**  
**DOD Oversight of the Physical Fitness**  
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# Comments From the Department of Defense



FORCE MANAGEMENT  
POLICY

ASSISTANT SECRETARY OF DEFENSE  
4000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-4000

NOV - 2 1998



Mr. Mark E. Gebicke  
Director, Military Operations and Capabilities Issues  
National Security and International Affairs Divisions  
U.S. General Accounting Office  
Washington, DC 20548

Dear Mr. Gebicke:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "GENDER ISSUES: Improved Guidance and Oversight Are Needed to Ensure Validity and Equity of Fitness Standards," dated September 23, 1998 (GAO Code 703256)/OSD Case 1695). The DoD concurs with the report findings and recommendations.

The DoD initiated a number of actions to revamp the physical fitness and body fat program prior to the GAO review. We are making significant improvements in this area, and will continue to build on these efforts. We are revising DoD Directive 1308.1, Physical Fitness and Body Fat Program, and DoD Instruction 1308.3, Physical Fitness and Body Fat Procedures to focus the purpose of the DoD fitness program and to create common standards related to general fitness and health for fitness and body fat evaluation and measurement.

The detailed DoD response to each of the GAO recommendations, including planned actions and estimated timeframes for completion is provided in the enclosure. Technical and clarifying comments are being provided separately.

In addition to the enclosed comments, we recommend that you include in the Executive Summary the fact that the subject of fitness standards and body fat composition is a complex subject, with experts in research and academia often unable to come to a consensus on key issues. In addition, we recommend that the Executive Summary include a brief description of background information about the DoD work in this area that occurred before the GAO study. We recognize that this background information is located in chapter 4 of the report. However, it is important to identify these efforts and the fact that the Department takes this issue seriously at the beginning of the study. We believe that both of these additions more clearly describe the environment prior to the GAO study.



Appendix I  
Comments From the Department of Defense

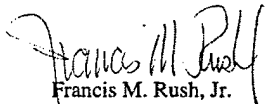
Request that you make the following additions to the Executive Summary:

a. Add to the first paragraph of the Executive Summary: "Developing standards and measurements for general fitness and health is a complex matter, where academic and research experts often differ on conclusions and research."

b. Add to the Background section of the Executive Summary: "DoD began addressing deficiencies in the November 1995 policy less than six months after it was published, when problems began to arise. The Assistant Secretary of Defense for Force Management Policy created a joint Service working group to work the issues. Also in 1996, DoD asked the Institute of Medicine (IOM) to conduct a study to help analyze the often conflicting research in this area, and make recommendations to improve DoD policy. Since 1996, the Services have made progress in adjusting standards based on more objective data, and have worked cooperatively to resolve research issues. Immediately after the publication of the IOM study in March 1998, the joint Service working group began work to analyze the recommendations."

The Department appreciates the opportunity to comment on the draft report.

Sincerely,



Francis M. Rush, Jr.  
Acting Assistant Secretary

Enclosure:  
As stated

See p. 9.

See pp. 2, 9.

GENERAL ACCOUNTING OFFICE DRAFT REPORT  
DATED SEPTEMBER. 23, 1998  
(GAO CODE 703256) (OSD CASE 1695)

"GENDER ISSUES: IMPROVED GUIDANCE AND OVERSIGHT ARE  
NEEDED TO ENSURE VALIDITY AND EQUITY OF FITNESS STANDARDS"

Now on pp. 8, 24.

**RECOMMENDATION 1:** GAO recommends that the Secretary of Defense revise the Department's physical fitness regulations to clearly state that the objective of the physical fitness program is to enhance general fitness and health and make clear that the program is not intended to address the capability to perform specific jobs or missions (p. 12, p. 38/GAO Draft Report).

**DoD RESPONSE:** Concur. The Department created a joint Service working group in 1996 to analyze DoD policy on physical fitness and body fat composition. In addition, in 1996, the Department of Defense asked the Institute of Medicine to study available research on key aspects of body fat composition, and make recommendations to strengthen DoD policy. That study was published in March 1998. The joint Service working group evaluated the findings in that report and determined that the purpose of the current policy contained in DoDD 1308.1 and DoDI 1308.3 should focus on general health and fitness. Preliminary actions to revise these policy documents are underway and will indicate that the objective of the program is to enhance general fitness and health. In addition, the revision will explain that this policy is not designed to be used to address specific job or mission performance. We expect to publish the revised policies by the end of 1999. Stating that the overall objective of the DoD physical fitness and body fat composition program is to enhance general fitness and health will not preclude the Department from establishing policies related to occupational or mission fitness needs, if such policies are needed. The standards and measurements developed for the overall DoD policy on fitness and body fat composition will not be used for occupational or mission related fitness unless scientific data indicates that there is an appropriate relationship.

Now on pp. 8, 35.

**RECOMMENDATION 2:** GAO recommends that the Secretary of Defense revise the Department's physical fitness regulations to establish clear DoD-wide policy for age and gender-based adjustments to fitness and body fat standards, requiring all Services to derive them scientifically, clearly document the basis used, and submit exceptions for approval (p.13, p. 56/GAO Draft Report).

**DoD RESPONSE:** Concur. The Department is already analyzing policy revisions to fitness and body fat standards. Considerations for age and gender will include a requirement for them to be derived scientifically, with any exceptions also being based on science and submitted for approval to OSD. We will include these



provisions in the revision of the Departments policies on fitness and body fat composition, which we expect to be complete by the end of 1999.

Now on pp. 8, 35.

**RECOMMENDATION 3:** GAO recommends that the Secretary of Defense revise the Department's physical fitness regulations to establish a DoD-wide approach, based on current scientific research, to estimating body fat percentage (p. 13, p. 57/GAO Draft Report).

**DoD RESPONSE:** Concur. As early as 1996, with the creation of the joint Service working group to review fitness and body fat composition policy, the Department has been working toward establishing a single approach to body fat measurement for general fitness and health. The Institute of Medicine Report published in March 1998 provided the Department significant information on how to accomplish that objective. The joint Service working group is analyzing the report's recommendations. A change in DoD policy to establish a DoD wide approach to estimating body fat for the purpose of general fitness and health will be included in the revision of the DoD policy on fitness and body fat composition to be completed by the end of 1999.

Now on pp. 8, 41.

**RECOMMENDATION 4:** GAO recommends that the Secretary of Defense revise the Department's physical fitness regulations to establish a mechanism for providing policy and research coordination of the military services' physical fitness and body fat programs (p.13, p. 66/GAO Draft Report).

**DoD RESPONSE:** Concur. The joint working group established in 1996 is the nucleus of a body of experts that can advise DoD policymakers on research needs, research evaluation and evaluation of the effect of DoD policies in this area. The Department is currently studying the best way to formalize a mechanism to provide these needed services. We will include procedures about such a mechanism in the revision of the Department's fitness and body fat composition policies, which will be completed by the end of 1999.

Now on pp. 8, 41.

**RECOMMENDATION 5:** GAO recommends that the Secretary of Defense revise the Department's physical fitness regulations to define the statistical information needed to monitor fitness trends and ensure program effectiveness, and require that this information be maintained by all services and provided in the currently required annual reports (p. 13, p. 66/Draft GAO Report).

**DoD RESPONSE:** Concur. Currently the Services maintain a variety of information about fitness and body fat composition measurement results. The types of information vary among the Services. It is difficult to evaluate the impact of the DoD policy and see trends. In our revision to DoD policy on fitness and body fat composition, we will include specific guidance to the Services on what information they need to report to OSD, and what information they need to maintain. The summation of this information collection will allow OSD and the Services to evaluate

the effectiveness of policies, see trends and conduct needed analysis. This revision will be completed by the end of 1999.

Now on pp. 8, 24.

**RECOMMENDATION 6:** GAO recommends that the Secretary of Defense ensure that the Services implement the existing requirements that personnel be tested in all three areas cited in the regulation - cardiovascular endurance, muscular strength and endurance, and body composition (p. 12, p. 38/Draft GAO Report).

**DoD RESPONSE:** Concur. We will revise the DoD policy on fitness and body fat composition to require that the Services test military personnel in these three areas. We may also elect to include other fitness tests that relate to general fitness and health. These policies will not preclude the Department from establishing separate policies for occupational and mission related fitness if such policies are needed. The tests established for general fitness will not be used for occupational or mission related fitness unless scientific data indicates that there is an appropriate relationship. The policy revision will be completed by the end of 1999.

Now on pp. 8, 35.

**RECOMMENDATION 7:** GAO recommends that the Secretary of Defense ensure that the Services implement the existing requirements that all Service members, regardless of age, be tested for fitness (p. 13, p. 57/Draft GAO Report).

**DoD RESPONSE:** Concur. We will revise the DoD policy on fitness and body fat composition to require that the Services test military members, regardless of age, for fitness. The policy revision will be completed by the end of 1999, and will require a statement from each Service in the DoD annual report attesting to the fact that the Service is complying with the DoD policy.

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